IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(Currently Amended) ~~Method~~ A method of position determination in a radio system, the method comprising the acts of:

~~correlating~~ multiplying a signal received ~~at a unit~~ by a multiplier with a carrier signal from a carrier generator to form a mixed down signal;

correlating the mixed down signal with a replica signal ~~at the unit, and~~ from a code generator to form a correlated signal;

processing the correlated signal with an ~~optimisation~~ optimization function comprising an exponential term in combination with a second term to form an output signal that provides a position measurement in indoor environments with multiple diffuse reflections; and

feeding back the output signal to control the carrier

generator and the code generator for improving accuracy of the position measurement.

2.(Currently Amended) ~~A~~ The method according to claim 1 wherein the exponential term is in the form $Be^{-\alpha t}$.

3.(Currently Amended) ~~A~~ The method according to claim 1 wherein the second term is of the form:

$$\tau_0\sqrt{(1-\frac{\tau_0^2}{t_2})}.$$

Claim 4 (Canceled)

5.(Currently Amended) ~~A~~ The method according to claim 1, further comprising the act of fitting the ~~optimisation~~ optimization function and a Line-of Sight correlation function with a set of parameters.

Claim 6 (Canceled)

7. (Currently Amended) ~~A~~ The method according to claim 1 comprising first operating a multipath mitigation technique to effect correlation of the received and replica signals.

8. (Currently Amended) ~~A~~ The method according to ~~claim 5~~ claim 7, wherein the multipath mitigation technique comprises a Multipath Estimating Delay Locks Loop technique.

9. (Currently Amended) ~~A~~ The method according to ~~claim 5~~ claim 7, wherein the multipath mitigation technique comprises a Minimum Mean Square Error technique.

10. (Previously Presented) A computer program product directly loadable into the internal memory of a digital computer, comprising software code portions for performing the method of claim 1 when said product is run on a computer.

11. (Previously Presented) A computer program directly loadable into the internal memory of a digital computer, comprising software code portions for performing the method of claim 1 when

said program is run on a computer.

Claims 12-13 (Canceled)

14. (Currently Amended) ~~Apparatus~~ An apparatus for position determination of a radio system, the apparatus comprising:

a carrier generator for providing a carrier signal;

a multiplier for multiplying a received signal with the carrier signal to form a mixed down signal;

means to correlate ~~a signal received at a unit~~ the with a replica signal and form a correlated signal; ~~at the unit,~~ and

a code generator to provide the replica signal; and

means to process the correlated signal with an ~~optimisation~~ optimization function comprising an exponential term in combination with a second term to form an output signal that provides a position measurement in indoor environments with multiple diffuse reflections;

wherein the output signal is fed back to control the carrier generator and the code generator for improving accuracy of the position measurement.

15. (Currently Amended) ~~Apparatus~~ The apparatus according to claim 14 wherein the exponential term is in the form $Be^{\alpha t}$.

16. (Currently Amended) ~~Apparatus~~ The apparatus according to claim 14 or 15 wherein the second term is of the form:

$$\tau_0\sqrt{(1-\frac{\tau_0^2}{t_2})}.$$

Claim 17 (Canceled)

18. (Currently Amended) ~~Apparatus~~ The apparatus according to claim 14, further comprising means to fit the ~~optimisation~~ optimization function and a Line-of Sight correlation function with a set of parameters.

Claim 19 (Canceled)

20. (Currently Amended) ~~Apparatus~~ The apparatus according to claim 14, further comprising means to first operate a multipath

mitigation technique to effect correlation of the received and replica signals.

21. (Currently Amended) ~~Apparatus~~ The apparatus according to claim 20, wherein the multipath mitigation technique comprises a Multipath Estimating Delay Locks Loop technique.

22. (Currently Amended) ~~Apparatus~~ The apparatus according to claim 20, wherein the multipath mitigation technique comprises a Minimum Mean Square Error technique.